

ECOLOGY

ALL FORMS OF LIFE IN RELATION TO ENVIRONMENT

OFFICIAL PUBLICATION OF THE
ECOLOGICAL SOCIETY OF AMERICA

VOLUME 64, 1983

Published Bimonthly at Tempe, Arizona

by the

ECOLOGICAL SOCIETY OF AMERICA

ECOLOGY

Published by the

ECOLOGICAL SOCIETY OF AMERICA

Copyright © 1983, by The Ecological Society of America

US ISSN 0012-9658

Managing Editor, Lee N. Miller

Ecological Society of America
Cornell University
Corson Hall
Ithaca, NY 14853

COMMUNICATIONS AND SUBSCRIPTIONS

All manuscripts should be submitted to the MANAGING EDITOR, Lee N. Miller, Ecological Society of America, Cornell University, Corson Hall, Ithaca, NY 14853. For information on the current status of their manuscripts, authors may contact Candace Baker or Joanne Andrews, Office Managers, at the same address, or telephone (607) 256-3221.

All books (and pamphlets) for review should be submitted to the BOOK REVIEW EDITOR (Marilyn S. Darling, Department of Botany, Duke University, Durham, NC 27706). The Society is not responsible for manuscripts, books for review, or other unsolicited materials which are sent to it addressed incorrectly and which require forwarding.

Subscription price for 1984: In the United States, \$80.00 per year; in foreign countries add \$8.00 postage. Single issues from the current year: \$14.00 each. Single back issues: \$16.00; complete back volumes, as available: \$90.00. All back issues are plus postage. Special rates for back issues are available to active and sustaining members.

Remittances for memberships, subscriptions, or back issues should be made payable to the Ecological Society of America.

Missing issues will be supplied free when lost in the mails if written notice is received by the Business Manager (address below) within three months of the date of publication.

Correspondence regarding membership or subscriptions, including payment of membership dues, new non-member and institutional subscriptions, change of address, back issues, missing issues, and discontinuances should be addressed to the **Business Manager**, Ecological Society of America, Center for Environmental Studies, Arizona State University, Tempe, AZ 85287.

Requests for permission to use copyrighted material should be directed to the **Permissions Editor**, the Ecological Society of America, Center for Environmental Studies, Arizona State University, Tempe, AZ 85287.

STATEMENT OF OWNERSHIP AND MANAGEMENT

ECOLOGY (ISSN 0012-9658) is published six times per year in February, April, June, August, October and December by the Ecological Society of America (rates listed above). The Office of Publication and the General Business Office are located at the Center for Environmental Studies, Arizona State University, Tempe, AZ 85287. The Managing Editor is Dr. Lee N. Miller, Cornell University, Corson Hall, Ithaca, NY 14853. The Business Manager is Dr. Duncan T. Patten, Ecological Society of America, Center for Environmental Studies, Arizona State University, Tempe, AZ 85287. The Owner and Publisher is The Ecological Society of America, Center for Environmental Studies, Arizona State University, Tempe, AZ 85287. The Ecological Society of America is a nonprofit organization founded in 1915 and incorporated under the laws of Wisconsin in 1927. There are no bondholders, mortgagees, or other security holders. **POSTMASTER:** For undeliverable copies, return postage is guaranteed to the Ecological Society of America, Center for Environmental Studies, Arizona State University, Tempe, AZ 85287. Second-class postage paid at Tempe, AZ and additional mailing offices.

EXTENT AND NATURE OF CIRCULATION. *Average number of copies of each issue published during the preceding twelve months:* (A) total number of copies printed, 9700; (B.1) sales through dealers and carriers, street vendors and counter sales, 0; (B.2) paid mail subscriptions, 8053; (C) total paid circulation, 8053; (D) samples, complimentary, and other free copies, 50; (E) total distribution, 8103; (F.1) office use, left over, unaccounted, spoiled after printing, 1597; (F.2) returns from news agents, 0; (G) total, 9700. *Actual number of copies of single issue published nearest to filing date:* (A) total number of copies printed, 9500; (B.1) sales through dealers and carriers, street vendors and counter sales, 0; (B.2) paid mail subscriptions, 8376; (C) total paid circulation, 8376; (D) samples, complimentary, and other free copies, 58; (E) total distribution, 8434; (F.1) office use, left over, spoiled after printing, 1066; (F.2) returns from news agents, 0; (G) total, 9500.

TABLE OF CONTENTS, Volume 64, 1983

NUMBER 1, FEBRUARY

KNOWLES, P., AND M. C. GRANT. Age and size structure analyses of Engelmann spruce, ponderosa pine, lodgepole pine, and limber pine in Colorado	1-9
CUKER, B. E. Competition and coexistence among the grazing snail <i>Lymnaea</i> , Chironomidae, and Microcrustacea in an arctic epilithic lacustrine community	10-15
KING, D., AND J. ROUGHGARDEN. Energy allocation patterns of the California grassland annuals <i>Plantago erecta</i> and <i>Clarkia rubicunda</i>	16-24
TATE, C. M., AND J. L. MEYER. The influence of hydrologic conditions and successional state on dissolved organic carbon export from forested watersheds	25-32
MEYER, J. L., AND C. M. TATE. The effects of watershed disturbance on dissolved organic carbon dynamics of a stream	33-44
PULLIAM, H. R. Ecological community theory and the coexistence of sparrows	45-52
PERRON, F. E. Growth, fecundity, and mortality of <i>Conus pennaceus</i> in Hawaii	53-62
BERG, B., AND G. EKBOHM. Nitrogen immobilization in decomposing needle litter at variable carbon : nitrogen ratios	63-67
CHENEY, C. AND R. A. HOUGH. Factors controlling photosynthetic productivity in a population of <i>Cladophora fracta</i> (Chlorophyta)	68-77
RUSSELL, E. W. B. Indian-set fires in the forests of the northeastern United States	78-88
DE STEVEN, D. Reproductive consequences of insect seed predation in <i>Hammamelis virginiana</i>	89-98
HEMOND, H. F. The nitrogen budget of Thoreau's Bog	99-109
DUFFY, D. C. The ecology of tick parasitism on densely nesting Peruvian seabirds	110-119
KEPHART, S. R. The partitioning of pollinators among three species of <i>Asclepias</i>	120-133
WEBB, W. L., W. K. LAUENROTH, S. R. SZAREK, AND R. S. KINERSON. Primary production and abiotic controls in forests, grasslands, and desert ecosystems in the United States	134-151
MACMILLEN, R. E., AND D. S. HINDS. Water regulatory efficiency in heteromyid rodents: a model and its application	152-164
GINSBERG, H. S. Foraging ecology of bees in an old field	165-175
DOHERTY, P. J. Tropical territorial damselfishes: is density limited by aggression or recruitment	176-190
CONNOR, E. F., S. H. FAETH, AND D. SIMBERLOFF. Leafminers on oak: the role of immigration and in situ reproductive recruitment	191-204
SCHOEN, D. J., AND D. FRUCHTER. A calculator-assisted method of random sampling	205-206
STRONG, D. R., JR., AND P. D. STILING. Wing dimorphism changed by experimental density manipulation in a planthopper (<i>Prokelisia marginata</i> , Homoptera, Delphacidae)	206-209
SPRUGEL, D. G. Correcting for bias in log-transformed allometric equations	209-210

NUMBER 2, APRIL

CARPENTER, S. R. Resource limitation of larval treehole mosquitoes subsisting on beech detritus	219-223
LAW, R. A model for the dynamics of a plant population containing individuals classified by age and size	224-230

DESPAIN, D. G. Nonpyrogenous climax lodgepole pine communities in Yellowstone National Park	231-234
AHMAD, S. Mixed-function oxidase activity in a generalist herbivore in relation to its biology, food plants, and feeding history	235-243
POUGH, F. H., T. L. TAIGEN, M. M. STEWART, AND P. F. BRUSSARD. Behavioral modifications of evaporative water loss by a Puerto Rican tree frog ...	244-252
BRIAND, F. Environmental control of food web structure	253-263
BOOKMAN, S. S. Costs and benefits of flower abscission and fruit abortion in <i>Asclepias speciosa</i>	264-273
ACKERMAN, J. D. Diversity and seasonality of male euglossine bees (Hymenoptera: Apidae) in Central Panama	274-283
HUMPHREY, S. R., F. J. BONACCORSO, AND T. L. ZINN. Guild structure of surface-gleaning bats in Panamá	284-294
WILSON, W. H., JR. The role of density dependence in a marine infaunal community	295-306
MCNAUGHTON, S. J., L. L. WALLACE, AND M. B. COUGHENOUR. Plant adaptation in an ecosystem context: effects of defoliation, nitrogen, and water on growth of an African C ₄ sedge	307-318
NUDDS, T. D. Niche dynamics and organization of waterfowl guilds in variable environments	319-330
KEDDY, P. A. Shoreline vegetation in Axe Lake, Ontario: effects of exposure on zonation patterns	331-344
HARE, J. D. Seasonal variation in plant-insect associations: utilization of <i>Solanum dulcamara</i> by <i>Leptinotarsa decemlineata</i>	345-361
GREENFIELD, M. D. Reproductive isolation in clearwing moths (Lepidoptera: Sesiidae): a tropical-temperate comparison	362-375
CHAPIN, F. S., III, AND R. A. KEDROWSKI. Seasonal changes in nitrogen and phosphorus fractions and autumn retranslocation in evergreen and deciduous taiga trees	376-391
LANDA, K., AND D. RABINOWITZ. Relative preference of <i>Arphia sulphurea</i> (Orthoptera: Acrididae) for sparse and common prairie grasses	392-395
ARONSON, R. B., AND T. J. GIVNISH. Optimal central-place foragers: a comparison with null hypotheses	395-399
HIEBERT, S. M., AND W. A. CALDER, III. Sodium, potassium, and chloride in floral nectars: energy-free contributions to refractive index and salt balance	399-402
JANSSEN, J. How do bluegills 'select' large <i>Daphnia</i> in turbid water?	403
RICE, W. R. Sensory modality: an example of its effect on optimal foraging behavior	403-406

NUMBER 3, JUNE

CONGDON, J. D., J. W. GIBBONS, AND J. L. GREENE. Parental investment in the chicken turtle (<i>Deirochelys reticularia</i>)	419-425
COLEY, P. D. Intraspecific variation in herbivory on two tropical tree species	426-433
SOUTHWICK, C. H., M. F. SIDDIQI, AND J. R. OPPENHEIMER. Twenty-year changes in rhesus monkey populations in agricultural areas of northern India	434-439
BRITTAIN, J. E. The influence of temperature on nymphal growth rates in mountain stoneflies (Plecoptera)	440-446
SAN JOSÉ, J. J., AND M. R. FARIÑAS. Changes in tree density and species composition in a protected Trachypogon savanna, Venezuela	447-453
TER BRAAK, C. J. F. Principal components biplots and alpha and beta diversity	454-462
CHRISTIAN, K., C. R. TRACY, AND W. P. PORTER. Seasonal shifts in body temperature and use of microhabitats by Galapagos land iguanas (<i>Conolophus pallidus</i>)	463-468

TURNER, M. D., AND D. RABINOWITZ. Factors affecting frequency distributions of plant mass: the absence of dominance and suppression in competing monocultures of <i>Festuca paradoxa</i>	469-475
WALDESCHMIDT, S., AND C. R. TRACY. Interactions between a lizard and its thermal environment: implications for sprint performance and space utilization in the lizard <i>Uta stansburiana</i>	476-484
CULVER, D. C., AND A. J. BEATTIE. Effects of ant mounds on soil chemistry and vegetation patterns in a Colorado montane meadow	485-492
HANSKI, I. Coexistence of competitors in patchy environment	493-500
SMITH, D. C. Factors controlling tadpole populations of the chorus frog (<i>Pseudacris triseriata</i>) on Isle Royale, Michigan	501-510
LOUDA, S. M. Seed predation and seedling mortality in the recruitment of a shrub, <i>Haplopappus venetus</i> (Asteraceae), along a climatic gradient	511-521
PETRAITIS, P. S. Grazing patterns of the periwinkle and their effect on sessile intertidal organisms	522-533
KINGSOLVER, J. G. Thermoregulation and flight in <i>Colias</i> butterflies: elevational patterns and mechanistic limitations	534-545
KINGSOLVER, J. G. Ecological significance of flight activity in <i>Colias</i> butterflies: implications for reproductive strategy and population structure	546-551
GLADFELTER, W. B., AND W. S. JOHNSON. Feeding niche separation in a guild of tropical reef fishes (Holocentridae)	552-563
SCHAFER, W. M., D. W. ZEH, S. L. BUCHMANN, S. KLEINHANS, M. V. SCHAFER, AND J. ANTRIM. Competition for nectar between introduced honey bees and native North American bees and ants	564-577
BRUGAM, R. B., AND B. J. SPEZIALE. Human disturbance and the paleolimnological record of change in the zooplankton community of Lake Harriet, Minnesota	578-591
HEINRICH, B., AND S. L. COLLINS. Caterpillar leaf damage, and the game of hide-and-seek with birds	592-602
UGLAND, K. I., AND J. S. GRAY. Reanalysis of Caswell's neutral models	603-605
CASWELL, H. Reply to a comment by Ugland and Gray	605-606
SCHULZ, W. C., AND C. N. SLOBODCHIKOFF. A stability measure for ecological systems	606-607
KRAUS, B. A test of the optimal-density model for seed scatterhoarding	608-610

NUMBER 4, AUGUST

FINDLEY, J. S., AND H. BLACK. Morphological and dietary structuring of a Zambian insectivorous bat community	625-630
MILLAR, J. S., AND R. M. ZAMMUTO. Life histories of mammals: an analysis of life tables	631-635
KARBAN, R., AND R. E. RICKLEFS. Host characteristics, sampling intensity, and species richness of Lepidoptera larvae on broad-leaved trees in southern Ontario	636-641
FIALA, K. L., AND J. D. CONGDON. Energetic consequences of sexual size dimorphism in nestling Red-winged Blackbirds	642-647
EVANS, E. W. The influence of neighboring hosts on colonization of prairie milkweeds by a seed-feeding bug	648-653
COOK, R. E., AND E. E. LYONS. The biology of <i>Viola fimbriatula</i> in a natural disturbance	654-660
MADANY, M. H., AND N. E. WEST. Livestock grazing-fire regime interactions within montane forests of Zion National Park, Utah	661-667
BARANGA, D. Changes in chemical composition of food parts in the diet of Colobus monkeys	668-673
ANDERSON, D. R., K. P. BURNHAM, G. C. WHITE, AND D. L. OTIS. Density estimation of small-mammal populations using a trapping web and distance sampling methods	674-680

YOUNG, D. R., AND W. K. SMITH. Effect of cloudcover on photosynthesis and transpiration in the subalpine understory species <i>Arnica latifolia</i>	681-687
WEIS, A. E., P. W. PRICE, AND M. LYNCH. Selective pressures on clutch size in the gall maker <i>Asteromyia carbonifera</i>	688-695
SORENSEN, F. C. Geographic variation in seedling Douglas-fir (<i>Pseudotsuga menziesii</i>) from the western Siskiyou Mountains of Oregon	696-702
ARMSTRONG, R. A. On the quantitative theory of resource partitioning in rhizomatous perennial plants: the influences of canopy structure, rhizome branching pattern, and self-thinning	703-709
MCCLURE, M. S. Population dynamics of a pernicious parasite: density-dependent vitality of red pine scale	710-718
HIGHSMITH, R. C. Sex reversal and fighting behavior: coevolved phenomena in a tanaid crustacean	719-726
SQUIBB, R. C., AND G. L. HUNT, JR. A comparison of nesting-ledges used by seabirds on St. George Island	727-734
PORTER, K. G., JR., J. D. ORCUTT, AND J. GERRITSEN. Functional response and fitness in a generalist filter feeder, <i>Daphnia magna</i> (Cladocera: Crustacea)	735-742
CHAPIN, F. S., III, AND W. C. OECHEL. Photosynthesis, respiration, and phosphate absorption by <i>Carex aquatilis</i> ecotypes along latitudinal and local environmental gradients	743-751
SKALSKI, J. R., D. S. ROBSON, AND M. A. SIMMONS. Comparative census procedures using single mark-recapture methods	752-760
HUNTER, R. D., AND W. D. RUSSELL-HUNTER. Bioenergetic and community changes in intertidal Aufwuchs grazed by <i>Littorina littorea</i>	761-769
STILING, P. D., AND D. R. STRONG. Weak competition among <i>Spartina</i> stem borers, by means of murder	770-778
HARTNETT, D. C., AND F. A. BAZZAZ. Physiological integration among intracolonial ramets in <i>Solidago canadensis</i>	779-788
FRITZ, R. S. Ant protection of a host plant's defoliator: consequence of an ant-membracid mutualism	789-797
HOFFMAN, S. G. Sex-related foraging behavior in sequentially hermaphroditic hogfishes (<i>Bodianus</i> spp.)	798-808
ZEDLER, P. H., C. R. GAUTIER, AND G. S. McMASTER. Vegetation change in response to extreme events: the effect of a short interval between fires in California chaparral and coastal scrub	809-818
CURTIS, L. A., AND L. E. HURD. Age, sex, and parasites: spatial heterogeneity in a sandflat population of <i>Ilyanassa obsoleta</i>	819-828
PUGESEK, B. C., AND K. L. DIEM. A multivariate study of the relationship of parental age to reproductive success in California gulls	829-839
KRUEGER, C. C., AND T. F. WATERS. Annual production of macroinvertebrates in three streams of different water quality	840-850
BULLOCK, S. H., J. H. BEACH, AND K. S. BAWA. Episodic flowering and sexual dimorphism in <i>Guarea rhopalocarpa</i> in a Costa Rican rain forest	851-861
REZNICK, D. The structure of guppy life histories: the tradeoff between growth and reproduction	862-873
DELCOURT, H. R., P. A. DELCOURT, AND E. C. SPIKER. A 12 000-year record of forest history from Cahaba Pond, St. Clair County, Alabama	874-887
MARTINDALE, S. Foraging patterns of nestling Gila Woodpeckers	888-898
RIECHERT, S. E., AND A. B. CADY. Patterns of resource use and tests for competitive release in a spider community	899-913
MURPHY, M. T. Ecological aspects of the reproductive biology of Eastern Kingbirds: geographic comparisons	914-928
HORTON, C. C., AND D. H. WISE. The experimental analysis of competition between two syntopic species of orb-web spiders (Araneae: Araneidae)	929-944
ASKINS, R. A. Foraging ecology of temperate-zone and tropical woodpeckers	945-956

ST. JOHN, T. V., D. C. COLEMAN, AND C. P. P. REID. Associations of vesicular-arbuscular mycorrhizal hyphae with soil organic particles	957-959
FULLER, P. J., AND M. E. HAY. Is glue production by seeds of <i>Salvia columbariae</i> a deterrent to desert granivores?	960-963

NUMBER 5, OCTOBER

ROUBIK, D. W. Experimental community studies: time-series tests of competition between African and neotropical bees	971-978
BENNETT, A. F., AND L. D. HOUCK. The energetic cost of courtship and aggression in a plethodontid salamander	979-983
REBAR, C., AND W. CONLEY. Interactions in microhabitat use between <i>Dipodomys ordii</i> and <i>Onychomys leucogaster</i>	984-988
CRAWFORD, K. M., J. R. SPOTILA, AND E. A. STANDORA. Operative environmental temperatures and basking behavior of the turtle <i>Pseudemys scripta</i>	989-999
MOORE, J. Responses of an avian predator and its isopod prey to an acanthocephalan parasite	1000-1015
WRIGHT, S. J. The dispersion of eggs by a bruchid beetle among <i>Scheelea</i> palm seeds and the effect of distance to the parent palm	1016-1021
MEENTS, J. K., J. RICE, B. W. ANDERSON, AND R. D. OHMART. Nonlinear relationships between birds and vegetation	1022-1027
RAUSHER, M. D. Alteration of oviposition behavior by <i>Battus philenor</i> butterflies in response to variation in host-plant density	1028-1034
MCBRIEN, H., R. HARMSSEN, AND A. CROWDER. A case of insect grazing affecting plant succession	1035-1039
SEASTEDT, T. R., JR., D. A. CROSSLEY, AND W. W. HARGROVE. The effects of low-level consumption by canopy arthropods on the growth and nutrient dynamics of black locust and red maple trees in the southern Appalachians	1040-1048
SORK, V. L. Mammalian seed dispersal of pignut hickory during three fruiting seasons	1049-1056
AMBUEL, B., AND S. A. TEMPLE. Area-dependent changes in the bird communities and vegetation of southern Wisconsin forests	1057-1068
PUTZ, F. E. Treefall pits and mounds, buried seeds, and the importance of soil disturbance to pioneer trees on Barro Colorado Island, Panama	1069-1074
LANG, G. E., AND D. H. KNIGHT. Tree growth, mortality, recruitment, and canopy gap formation during a 10-year period in a tropical moist forest	1075-1080
WHITE, A. S. The effects of thirteen years of annual prescribed burning on a <i>Quercus ellipsoidalis</i> community in Minnesota	1081-1085
ROGERS, R. S. Annual variability in community organization of forest herbs: effect of an extremely warm and dry early spring	1086-1091
MADDOX, G. D., AND J. ANTONOVICS. Experimental ecological genetics in <i>Plantago</i> : a structural equation approach to fitness components in <i>P. aristata</i> and <i>P. patagonica</i>	1092-1099
SVEINBJÖRNSSON, B., AND W. C. OECHEL. The effect of temperature preconditioning on the temperature sensitivity of net CO ₂ flux in geographically diverse populations of the moss <i>Polytrichum commune</i>	1100-1108
TITUS, J. E., D. J. WAGNER, AND M. D. STEPHENS. Contrasting water relations of photosynthesis for two <i>Sphagnum</i> mosses	1109-1115
LUBCHENCO, J. <i>Littorina</i> and <i>Fucus</i> : effects of herbivores, substratum heterogeneity, and plant escapes during succession	1116-1123
LAMBERTI, G. A., AND V. H. RESH. Stream periphyton and insect herbivores: an experimental study of grazing by a caddisfly population	1124-1135
UNGER, P. A., AND W. M. LEWIS, JR. Selective predation with respect to body size in a population of the fish <i>Xenomelaniris venezuelae</i> (Atherinidae)	1136-1144
PACE, M. L., K. G. PORTER, AND Y. S. FEIG. Species- and age-specific differences in bacterial resource utilization by two co-occurring cladocerans ..	1145-1156

HULBURT, E. M. The unpredictability of the marine phytoplankton	1157-1170
BRADFORD, D. F. Winterkill, oxygen relations, and energy metabolism of a submerged dormant amphibian, <i>Rana muscosa</i>	1171-1183
THRESHER, R. A. Habitat effects on reproductive success in the coral reef fish, <i>Acanthochromis polyacanthus</i> (Pomacentridae)	1184-1199
GALLAGHER, E. D., P. A. JUMARS, AND D. D. TRUEBLOOD. Facilitation of soft-bottom benthic succession by tube builders	1200-1216
FISHER, S. G., AND L. J. GRAY. Secondary production and organic matter processing by collector macroinvertebrates in a desert stream	1217-1224
ARRUDA, J. A., G. R. MARZOLF, AND R. T. FAULK. The role of suspended sediments in the nutrition of zooplankton in turbid reservoirs	1225-1235
GEORGIAN, T., AND J. B. WALLACE. Seasonal production dynamics in a guild of periphyton-grazing insects in a southern Appalachian stream	1236-1248
NEWBOLD, J. D., J. W. ELWOOD, R. V. O'NEILL, AND A. L. SHELDON. Phosphorus dynamics in a woodland stream ecosystem: a study of nutrient spiralling	1249-1265
BÄRLOCHER, F. Seasonal variation of standing crop and digestibility of CPOM in a Swiss Jura stream	1266-1272
SOLLINS, P., G. SPYCHER, AND C. TOPIK. Processes of soil organic-matter accretion at a mudflow chronosequence, Mt. Shasta, California	1273-1282
WILLIAMS, B. K. Some observations on the use of discriminant analysis in ecology	1283-1291
GARBUTT, K., AND A. R. ZANGERL. Application of genotype-environment interaction analysis to niche quantification	1292-1296
CHESSON, J. The estimation and analysis of preference and its relationship to foraging models	1297-1304
MUMME, R. L., W. D. KOENIG, AND F. A. PITELKA. Are Acorn Woodpecker territories aggregated?	1305-1307
BURGESS, J. W. Reply to a comment by R. L. Mumme et al.	1307-1308
SHULMAN, M. J. Species richness and community predictability in coral reef fish faunas	1308-1311
ST. OMER, L., AND S. M. HORVATH. Elevated carbon dioxide concentrations and whole plant senescence	1311-1314
RAU, G. H., A. J. MEARNS, D. R. YOUNG, R. J. OLSON, H. A. SCHAFER, AND I. R. KAPLAN. Animal $^{13}\text{C}/^{12}\text{C}$ correlates with trophic level in pelagic food webs	1314-1318
PETRAITIS, P. S. Presentation of niche measure relationships when more than three resource classes are involved	1318-1320

NUMBER 6, DECEMBER

JURIK, T. W. Reproductive effort and CO_2 dynamics of wild strawberry populations	1329-1342
SIGAL, L. L., AND T. H. NASH, III. Lichen communities on conifers in Southern California mountains: an ecological survey relative to oxidant air pollution	1343-1354
LASOIE, J. P., P. M. DOUGHERTY, P. B. REICH, T. H. HINCKLEY, C. M. METCALF, AND S. J. DINA. Ecophysiological investigations of understory eastern redcedar in central Missouri	1355-1366
MAGUIRE, D. A., AND R. T. T. FORMAN. Herb cover effects on tree seedling patterns in a mature hemlock-hardwood forest	1367-1380
NILSEN, E. T., M. R. SHARIFI, P. W. RUNDEL, W. M. JARRELL, AND R. A. VIRGINIA. Diurnal and seasonal water relations of the desert phreatophyte <i>Prosopis glandulosa</i> (honey mesquite) in the Sonoran Desert of California ..	1381-1393
HIBBS, D. E. Forty years of forest succession in central New England	1394-1401
RAUSHER, M. D., AND D. J. PAPAJ. Demographic consequences of discrimination among conspecific host plants by <i>Battus philenor</i> butterflies	1402-1410

TEMPEL, A. S. Bracken fern (<i>Pteridium aquilinum</i>) and nectar-feeding ants: a nonmutualistic interaction	1411-1422
WILBUR, H. M., P. J. MORIN, AND R. N. HARRIS. Salamander predation and the structure of experimental communities: anuran responses	1423-1429
MORIN, P. J., H. M. WILBUR, AND R. N. HARRIS. Salamander predation and the structure of experimental communities: responses of <i>Notophthalmus</i> and microcrustacea	1430-1436
PETERS, W. D., AND T. C. GRUBB, JR. An experimental analysis of sex-specific foraging in the Downy Woodpecker, <i>Picoides pubescens</i>	1437-1443
RICE, J., R. D. OHMART, AND B. W. ANDERSON. Turnovers in species composition of avian communities in contiguous riparian habitats	1444-1455
RYAN, M. J., G. A. BARTHOLOMEW, AND A. S. RAND. Energetics of reproduction in a neotropical frog, <i>Physalaemus pustulosus</i>	1456-1462
KINCAID, W. B., AND E. H. BRYANT. A geometric method for evaluating the null hypothesis of random habitat utilization	1463-1470
KINCAID, W. B., G. N. CAMERON, AND B. A. CARNES. Patterns of habitat utilization in sympatric rodents on the Texas coastal prairie	1471-1480
KARR, J. R., AND K. E. FREEMARK. Habitat selection and environmental gradients: dynamics in the 'stable' tropics	1481-1494
AUGUST, P. V. The role of habitat complexity and heterogeneity in structuring tropical mammal communities	1495-1507
SHULMAN, M. J., J. C. OGDEN, J. P. EBERSOLE, W. N. MCFARLAND, S. L. MILLER, AND N. G. WOLF. Priority effects in the recruitment of juvenile coral reef fishes	1508-1513
STEVENSON, R. J. Effects of current and conditions simulating autogenically changing microhabitats on benthic diatom immigration	1514-1524
WERNER, E. E., G. G. MITTELBACH, D. J. HALL, AND J. F. GILLIAM. Experimental tests of optimal habitat use in fish: the role of relative habitat profitability	1525-1539
WERNER, E. E., J. F. GILLIAM, D. J. HALL, AND G. G. MITTELBACH. An experimental test of the effects of predation risk on habitat use in fish	1540-1548
WOODWARD, B. D. Predator-prey interactions and breeding-pond use of temporary-pond species in a desert anuran community	1549-1555
SMOCK, L. A., AND K. L. HARLOWE. Utilization and processing of freshwater wetland macrophytes by the detritivore <i>Asellus forbesi</i>	1556-1565
KINGSTON, J. C., R. L. LOWE, E. F. STOERMER, AND T. B. LADEWSKI. Spatial and temporal distribution of benthic diatoms in northern Lake Michigan ..	1566-1580
KELLER, B. D. Coexistence of sea urchins in seagrass meadows: an experimental analysis of competition and predation	1581-1598
COULL, B. C., AND J. B. J. WELLS. Refuges from fish predation: experiments with phytal meiofauna from the New Zealand rocky intertidal	1599-1609
DUGGINS, D. O. Starfish predation and the creation of mosaic patterns in a kelp-dominated community	1610-1619
FORSYTH, D. J., T. J. PETERLE, AND L. W. BANDY. Persistence and transfer of ³⁶ Cl-DDT in the soil and biota of an old-field ecosystem: a six-year balance study	1620-1636
BOSSERMAN, R. W. Elemental composition of <i>Utricularia</i> -periphyton ecosystems from Okefenokee Swamp	1637-1645
MAC NALLY, R. C. On assessing the significance of interspecific competition to guild structure	1646-1652
GARBER, R. C., W. E. FRY, AND O. C. YODER. Conditional field epidemics on plants: a resource for research in population biology	1653-1655
CASTILLO L., J. A., AND W. G. EBERHARD. Use of artificial webs to determine prey available to orb weaving spiders	1655-1658
BAKKEN, G. S., D. J. ERSKINE, AND W. R. SANTEE. Construction and operation of heated taxidermic mounts used to measure standard operative temperature	1658-1662

(Contents Continued from Outside Back Cover)

Coexistence of sea urchins in seagrass meadows: an experimental analysis of competition and predation	Brian D. Keller	1581
Refuges from fish predation: experiments with phytal meiofauna from the New Zealand rocky intertidal	Bruce C. Coull and J. B. J. Wells	1599
Starfish predation and the creation of mosaic patterns in a kelp-dominated community	David O. Duggins	1610
Persistence and transfer of ³⁶ Cl-DDT in the soil and biota of an old-field ecosystem: a six-year balance study	D. J. Forsyth, T. J. Peterle, and L. W. Bandy	1620
Elemental composition of <i>Utricularia</i> -periphyton ecosystems from Okefenokee Swamp	Robert W. Bosserman	1637
On assessing the significance of interspecific competition to guild structure ...	Ralph C. Mac Nally	1646
Notes and Comments:		
Conditional field epidemics on plants: a resource for research in population biology	Robert C. Garber, William E. Fry, and O. C. Yoder	1653
Use of artificial webs to determine prey available to orb weaving spiders	José A. Castillo L. and William G. Eberhard	1655
Construction and operation of heated taxidermic mounts used to measure standard operative temperatures	George S. Bakken, Dale J. Erskine, and William R. Santee	1658
Reviews: Charnov: The theory of sex allocation— <i>Thomas R. Meagher</i> ; Wallwork: Desert soil fauna— <i>D. A. Crossley, Jr.</i> ; West: Temperate deserts and semi-deserts— <i>Paul J. Fonteyn</i> ; Bourlière: Tropical savannas— <i>David C. Coleman</i> ; Gore: Mires: swamp, bog, fen and moor— <i>Paul H. Glaser</i> and <i>H. E. Wright, Jr.</i> ; Frankland, Hedger, and Swift: Decomposer basidiomycetes: their biology and ecology— <i>Douglas E. Eveleigh</i> ; Barnard: Animal behaviour: ecology and evolution— <i>P. H. Klopfer</i> ; Kinzel: Pflanzenökologie und Mineralstoffwechsel— <i>R. Bornkamm</i>		1663
Books and Monographs received for review		1669
Ad hoc Editors of Manuscripts		1671
Reviewers of Manuscripts		1671
Index for Volume 64		1677

CONTENTS

Reproductive effort and CO ₂ dynamics of wild strawberry populations	Thomas W. Jurik	1329
Lichen communities on conifers in Southern California mountains: an ecological survey relative to oxidant air pollution	Lorene L. Sigal and Thomas H. Nash III	1343
Ecophysiological investigations of understory eastern redcedar in central Missouri	James P. Lassole, Phillip M. Dougherty, Peter B. Reich, Thomas M. Hinckley, Clifford M. Metcalf, and Stephen J. Dina	1355
Herb cover effects on tree seedling patterns in a mature hemlock-hardwood forest	Douglas A. Maguire and Richard T. T. Forman	1367
Diurnal and seasonal water relations of the desert phreatophyte <i>Prosopis glandulosa</i> (honey mesquite) in the Sonoran Desert of California	Erik Tallak Nilsen, M. Rasoul Sharifi, Philip W. Rundel, Wesley M. Jarrell, and Ross A. Virginia	1381
Forty years of forest succession in central New England	David E. Hibbs	1394
Demographic consequences of discrimination among conspecific host plants by <i>Battus philenor</i> butterflies	Mark D. Rausher and Daniel R. Papaj	1402
Bracken fern (<i>Pteridium aquilinum</i>) and nectar-feeding ants: a nonmutualistic interaction	Alice S. Tempel	1411
Salamander predation and the structure of experimental communities: anuran responses	Henry M. Wilbur, Peter J. Morin, and Reid N. Harris	1423
Salamander predation and the structure of experimental communities: responses of <i>Notophthalmus</i> and microcrustacea	Peter J. Morin, Henry M. Wilbur, and Reid N. Harris	1430
An experimental analysis of sex-specific foraging in the Downy Woodpecker, <i>Picoides pubescens</i>	Wm. David Peters and Thomas C. Grubb, Jr.	1437
Turnovers in species composition of avian communities in contiguous riparian habitats	J. Rice, R. D. Ohmart, and B. W. Anderson	1444
Energetics of reproduction in a neotropical frog, <i>Physalaemus pustulosus</i>	Michael J. Ryan, George A. Bartholomew, and A. Stanley Rand	1456
A geometric method for evaluating the null hypothesis of random habitat utilization	W. Bradley Kincaid and Edwin H. Bryant	1463
Patterns of habitat utilization in sympatric rodents on the Texas coastal prairie	W. Bradley Kincaid, Guy N. Cameron, and Bruce A. Carnes	1471
Habitat selection and environmental gradients: dynamics in the "stable" tropics	James R. Karr and Kathryn E. Freemark	1481
The role of habitat complexity and heterogeneity in structuring tropical mammal communities	Peter V. August	1495
Priority effects in the recruitment of juvenile coral reef fishes	Myra J. Shulman, John C. Ogden, John P. Ebersole, William N. McFarland, Steven L. Miller, and Nancy G. Wolf	1508
Effects of current and conditions simulating autogenically changing microhabitats on benthic diatom immigration	R. Jan Stevenson	1514
Experimental tests of optimal habitat use in fish: the role of relative habitat profitability	Earl E. Werner, Gary G. Mittelbach, Donald J. Hall, and James F. Gilliam	1525
An experimental test of the effects of predation risk on habitat use in fish	Earl E. Werner, James F. Gilliam, Donald J. Hall, and Gary G. Mittelbach	1540
Predator-prey interactions and breeding-pond use of temporary-pond species in a desert anuran community	Bruce Douglas Woodward	1549
Utilization and processing of freshwater wetland macrophytes by the detritivore <i>Asellus forbesi</i>	Leonard A. Smock and Kelley L. Harlowe	1556
Spatial and temporal distribution of benthic diatoms in northern Lake Michigan	John C. Kingston, Rex L. Lowe, Eugene F. Stoermer, and Theodore B. Ladewski	1566

